UNITED STATES DISTRICT COURT
DISTRICT OF MASSACHUSETTS

ASTELLAS INSTITUTE FOR REGENERATIVE MEDICINE, et al.,	*	
Plaintiffs,	*	
v.	*	Civil Action No. 17-cv-12239-ADB
IMSTEM BIOTECHNOLOGY, INC., et al.,	*	
Defendants.	*	

MEMORANDUM AND ORDER ON MOTION TO DISMISS

BURROUGHS, D.J.

Plaintiffs Astellas Institute for Regenerative Medicine and Stem Cell & Regenerative Medicine International, Inc. (collectively, "Plaintiffs") filed this action against Defendants ImStem Biotechnology, Inc., Xiaofang Wang, and Ren-He Xu (collectively, "Defendants") alleging claims for correction of inventorship under 35 U.S.C. § 256, unfair trade practices under Massachusetts General Laws Chapter 93A, conversion, unjust enrichment, misappropriation of trade secrets, and negligent misrepresentation. [Dkt. No. 1]. Defendants ImStem Biotechnology, Inc. and Xiaofang Wang (collectively, "Counterclaim Defendants") brought counterclaims against Plaintiffs for correction of inventorship under 35 U.S.C. § 256 and unjust enrichment. [Dkt. No. 20 ("Counterclaim Complaint")]. Plaintiffs moved to dismiss the counterclaims pursuant to Federal Rule of Civil Procedure 12(b)(6). [Dkt. No. 21]. For the reasons set forth below, Plaintiffs' motion to dismiss is DENIED.

I. BACKGROUND

The following facts are drawn from the Counterclaim Complaint, the well-pleaded allegations of which are taken as true for purposes of evaluating Plaintiffs' motion to dismiss. See Ruivo v. Wells Fargo Bank, 766 F.3d 87, 90 (1st Cir. 2014).

Plaintiff Astellas Institute for Regenerative Medicine is a Delaware corporation with a principal place of business in Marlborough, Massachusetts. [Dkt. No. 20, Countercl. ¶ 6]. Plaintiff Stem Cell & Regenerative Medicine International, Inc. ("SCRMI") is a Delaware corporation with a principal place of business in Marlborough, Massachusetts. [Id. ¶ 7].

Counterclaim Defendant ImStem Biotechnology Inc. ("ImStem") is a biotechnology company with a principal place of business in Farmington, Connecticut. [Id. ¶ 4]. Counterclaim Defendant Dr. Xiofang Wang is the Chief Technology Officer, Vice President, and a founder of ImStem. [Id. ¶ 5]. Dr. Wang is a research scientist with experience in the field of autoimmune disease and, in particular, he has studied the genetic mechanism for autoimmune disease in the experimental autoimmune encephalopathy ("EAE") mouse model for multiple sclerosis. [Id. ¶ 15].

Defendant Dr. Ren-He Xu was Dr. Wang's research mentor. [Id. ¶ 16]. In July 2010, Dr. Xu met with Dr. Shi-Jiang Lu, a colleague who worked at SCRMI, to discuss Dr. Wang's work. [Id. ¶ 16–17]. Dr. Lu suggested that Dr. Wang get in touch with his SCRMI colleagues, Drs. Erin Kimbrel and Robert Lanza, to discuss a collaboration involving mesenchymal stem cells ("MSCs") derived from hemangioblast cells. [Id. ¶ 17]. MSCs are a type of stem cell that are useful in treating a variety of disorders. [Dkt. 20, Answer ¶ 1]. Hemangioblast-derived MSCs

are created by first generating hemangioblasts from embryonic stem cells and then differentiating the hemangioblasts into MSCs. [Dkt. 20, Countercl. ¶ 25].

In his initial email exchange with Drs. Kimbrel and Lanza, Dr. Wang suggested that hemangioblast-derived MSCs could be used to treat autoimmune diseases, and proposed that their collaboration focus on using the EAE mouse model to test the effectiveness of MSCs to treat autoimmune diseases like multiple sclerosis. [Id. ¶¶2, 18, 33]. At that time, Drs. Kimbrel and Lanza were not familiar with the EAE mouse model or the potential to use hemangioblast-derived MSCs to treat autoimmune diseases. [Id. ¶¶ 19–20, 32]. In August 2010, the parties agreed to collaborate and, over the course of their collaboration, Dr. Wang conducted experiments involving hemangioblast-derived MSCs on the EAE mouse model. [Id. ¶¶ 23–24]. Dr. Wang's experiments yielded promising results, and Drs. Kimbrel, Lanza, Wang, and Xu worked together to publish this data in a scientific journal. Xiofang Wang et al., Human ESC-Derived MSCs Outperform Bone Marrow MSCs in the Treatment of an EAE Model of Multiple Sclerosis, 3 Stem Cell Reports 115 (2014) (the "Joint Publication") [Dkt. 1-2].

On November 30, 2011, Drs. Kimbrel and Lanza filed Provisional Patent Application No. 61/565,358 with the U.S. Patent and Trademark Office ("PTO"). This patent application incorporated data from the experiments that Dr. Wang had conducted during the parties' collaboration. [Dkt. 20, Countercl. ¶ 26]. On February 24, 2015, the PTO issued U.S. Patent No. 8,961,956 (the "'956 patent"), entitled "Mesenchymal Stromal Cells and Uses Related Thereto," and naming, *inter alia*, Drs. Kimbrel and Lanza as joint inventors. [Dkt. No. 20-1]. The '956 patent does not name Dr. Wang as a joint inventor.

On August 29, 2017, the PTO issued U.S. Patent No. 9,745,551 (the "'551 patent"), entitled "Mesenchymal-Like Stem Cells Derived from Human Embryonic Stem Cells, Methods

and Uses Thereof," and naming Drs. Wang and Xu as joint inventors. [Dkt. No. 1-1]. The '551 patent does not name Drs. Kimbrel and Lanza as joint inventors. On November 13, 2017, Plaintiffs filed suit against Defendants, seeking a correction of inventorship on the '551 patent and other state law remedies. [Dkt. No. 1]. On January 10, 2018, the Counterclaim Defendants filed their Answer and the Counterclaim Complaint, asserting claims for correction of inventorship of the '956 patent and unjust enrichment. [Dkt. No. 20]. On January 31, 2018, Plaintiffs moved to dismiss the Counterclaim Complaint. [Dkt. No. 21].

II. STANDARD OF REVIEW

On a motion to dismiss for failure to state a claim, the Court accepts as true all well-pleaded facts in the complaint and draws all reasonable inferences in the light most favorable to the plaintiff. United States ex rel. Hutcheson v. Blackstone Med., Inc., 647 F.3d 377, 383 (1st Cir. 2011). While detailed factual allegations are not required, the complaint must set forth "more than labels and conclusions," Bell Atl. Corp. v. Twombly, 550 U.S. 544, 555 (2007), and it must contain "factual allegations, either direct or inferential, respecting each material element necessary to sustain recovery under some actionable legal theory." Gagliardi v. Sullivan, 513 F.3d 301, 305 (1st Cir. 2008) (internal quotations and citations omitted). The facts alleged, taken together, must "state a claim to relief that is plausible on its face." A.G. ex rel. Maddox v. Elsevier, Inc., 732 F.3d 77, 80 (1st Cir. 2013) (quoting Twombly, 550 U.S. at 570). "A claim is facially plausible if supported by 'factual content that allows the court to draw the reasonable inference that the defendant is liable for the misconduct alleged.'" Eldredge v. Town of

Falmouth, MA, 662 F.3d 100, 104 (1st Cir. 2011) (quoting Ashcroft v. Iqbal, 556 U.S. 662, 678 (2009)).

When assessing the sufficiency of a complaint, the Court first "separate[s] the complaint's factual allegations (which must be accepted as true) from its conclusory legal allegations (which need not be credited)." Maddox, 732 F.3d at 80 (quoting Morales-Cruz v. Univ. of P.R., 676 F.3d 220, 224 (1st Cir. 2012)). Next, the Court "determine[s] whether the remaining factual content allows a 'reasonable inference that the defendant is liable for the misconduct alleged.'" Id. (quoting Morales-Cruz, 676 F.3d at 224). "[T]he court may not disregard properly pled factual allegations, 'even if it strikes a savvy judge that actual proof of those facts is improbable.'" Ocasio-Hernandez v. Fortuño-Burset, 640 F.3d 1, 12 (1st Cir. 2011) (quoting Twombly, 550 U.S. at 556). "[W]here the well-pleaded facts do not permit the court to infer more than the mere possibility of misconduct," however, a claim may be dismissed. Iqbal, 556 U.S. at 679.

III. DISCUSSION

A. Correction of Inventorship Claim

"'A person who alleges that [he or she] is a co-inventor of the invention claimed in an issued patent who was not listed as an inventor on the patent may bring a cause of action to correct inventorship in a district court under 35 U.S.C. § 256.'" Vapor Point LLC v. Moorhead, 832 F.3d 1343, 1348 (Fed. Cir. 2016) (quoting Eli Lilly & Co. v. Aradigm Corp., 376 F.3d 1352, 1357 n.1 (Fed. Cir. 2004)), cert. denied sub nom. Nanovapor Fuels Grp., Inc. v. Vapor Point, LLC, 137 S. Ct. 1121 (2017); see 35 U.S.C. § 256 (2012) (permitting correction of inventorship "[w]henever . . . through error an inventor is not named in an issued patent"). "Inventorship is a mixed question of law and fact: The overall inventorship determination is a question of law, but

it is premised on underlying questions of fact." Eli Lilly, 376 F.3d at 1362. Since "[p]atent issuance creates a presumption that the named inventors are the true and only inventors," to establish co-inventorship, the alleged co-inventor "must prove [his or her] contribution to the conception of the claims by clear and convincing evidence." Ethicon, Inc. v. U.S. Surgical Corp., 135 F.3d 1456, 1460–61 (Fed. Cir. 1998).

"Section 116 of Title 35 is the statutory locus of joint inventorship doctrine." Eli Lilly, 376 F.3d at 1358. It provides that when an invention is made jointly, the joint inventors "need not 'physically work together or at the same time,' 'make the same type or amount of contribution,' or 'make a contribution to the subject matter of every claim of the patent.'" Vapor Point, 832 F.3d at 1349 (quoting 35 U.S.C. § 116). The Federal Circuit has explained that "[a]ll that is required of a joint inventor is that he or she (1) contribute in some significant manner to the conception or reduction to practice of the invention, (2) make a contribution to the claimed invention that is not insignificant in quality, when that contribution is measured against the dimension of the full invention, and (3) do more than merely explain to the real inventors well-known concepts and/or the current state of the art." Israel Bio-Eng'g Project v. Amgen, Inc., 475 F.3d 1256, 1264 (Fed. Cir. 2007) (quoting Pannu v. Iolab Corp., 155 F.3d 1344, 1351 (Fed. Cir. 1998)).

While Section 116 sets forth "no explicit lower limit on the quantum or quality of inventive contribution required for a person to qualify as a joint inventor," Federal Circuit doctrine makes clear that "a person is a joint inventor only if he contributes to the conception of the claimed invention." Eli Lilly, 376 F.3d at 1358; see also Ethicon, 135 F.3d at 1460 ("Because '[c]onception is the touchstone of inventorship,' each joint inventor must generally contribute to the conception of the invention." (quoting Burroughs Wellcome Co. v. Barr Lab.,

Inc., 40 F.3d 1223, 1227–28 (Fed. Cir. 1994)). "Conception is defined as the formation in the mind of the inventor, of a definite and permanent idea of the complete and operative invention, as it is hereafter to be applied in practice." Stern v. Trustees of Columbia Univ. in City of New York, 434 F.3d 1375, 1378 (Fed. Cir. 2006) (quoting Hybritech Inc. v. Monoclonal Antibodies, Inc., 802 F.2d 1367, 1376 (Fed. Cir. 1986)) (quotation marks omitted). "Conception is complete when 'the idea is so clearly defined in the inventor's mind that only ordinary skill would be necessary to reduce the invention to practice, without extensive research or experimentation.'" Stern, 434 F.3d at 1378 (quoting Burroughs Wellcome, 40 F.3d at 1228). "In a joint invention, each inventor must contribute to the joint arrival at a definite and permanent idea of the invention as it will be used in practice." Univ. of Pittsburgh of Commonwealth Sys. of Higher Educ. v. Hedrick, 573 F.3d 1290, 1298 (Fed. Cir. 2009).

"'Inventorship is determined on a claim-by-claim basis.'" Vapor Point, 832 F.3d at 1349 (citation and alterations omitted). The inventorship analysis "begins as a first step with a construction of each asserted claim to determine the subject matter encompassed thereby." Trovan, Ltd. v. Sokymat SA, Irori, 299 F.3d 1292, 1302 (Fed. Cir. 2002) (citing Markman v. Westview Instruments, Inc., 52 F.3d 967, 996 n.7 (Fed. Cir. 1995) (Mayer, J., concurring), aff'd, 517 U.S. 370 (1996)). "The second step is then to compare the alleged contributions of each asserted co-inventor with the subject matter of the properly construed claim to then determine whether the correct inventors were named." Trovan, 299 F.3d at 1302 (citing Ethicon, 135 F.3d at 1462).

With these principles in mind, the Court turns to Plaintiffs' motion to dismiss the Counterclaim Defendants' Section 256 claim. Claim 1 of the '956 patent is "[a] method for

treating a disease or disorder" using hemangioblast-derived MSCs. [See Dkt. No. 20-1 at 86:32–38]. Claim 3 of the '956 patent is:

> The method of claim 1, wherein the disease or disorder is selected from ***multiple sclerosis***, systemic sclerosis, hematological malignancies, myocardial infarction, organ transplantation rejection, chronic allograft nephropathy, cirrhosis, liver failure, heart failure, GvHD, tibial fracture, left ventricular dysfunction, leukemia, myelodysplastic syndrome, Crohn's disease, diabetes, chronic obstructive pulmonary disease, osteogenesis imperfecta, homozygous familial hypocholesterolemia, treatment following meniscectomy, adult periodontitis, vasculogenesis in patients with severe myocardial ischemia, spinal cord injury, osteodysplasia, critical limb ischemia, diabetic foot disease, primary Sjogren's syndrome, osteoarthritis, cartilage defects, multisystem atrophy, amyotropic lateral sclerosis, cardiac surgery, refractory systemic lupus erythematosis, living kidney allografts, nonmalignant red blood cell disorders, thermal burn, Parkinson's disease, microfractures, epidermolysis bullosa, severe coronary ischemia, idiopathic dilated cardiomyopathy, osteonecrosis femoral head, lupus nephritis, bone void defects, ischemic cerebral stroke, after stroke, acute radiation syndrome, pulmonary disease, arthritis, bone regeneration, inflammatory respiratory conditions, respiratory conditions due to an acute injury, Adult Respiratory Distress Syndrome, post-traumatic Adult Respiratory Distress Syndrome, transplant lung disease, Chronic Obstructive Pulmonary Disease, emphysema, chronic obstructive bronchitis, bronchitis, an allergic reaction, damage due to bacterial pneumonia, damage due to viral pneumonia, asthma, exposure to irritants, tobacco use, atopic dermatitis, allergic rhinitis, hearing loss, autoimmune hearing loss, noise-induced hearing loss, psoriasis or any combination thereof.

[Id. at 86:43–87:6 (emphasis added)]. Claim 4 of the '956 patent is "[t]he method of claim 1, wherein the disease or disorder is uveitis, ***an autoimmune disorder***, an immune reaction against allogeneic cells, ***multiple sclerosis***, bone loss, cartilage damage, or lupus." [Id. at 87:7–10 (emphasis added)]. The Counterclaim Defendants allege that Dr. Wang is a joint inventor of the '956 patent because he contributed the idea of using hemangioblast-derived MSCs in the treatment of multiple sclerosis and other autoimmune disorders. [Dkt. No. 20, Countercl. ¶¶ 18, 28, 32–34]. Plaintiffs make two arguments as to why the Court should dismiss the Counterclaim Defendants' Section 256 claim, neither of which warrants dismissal at this stage of the litigation.

First, Plaintiffs argue that Dr. Wang has no plausible claim of joint inventorship because he contributed nothing to the '956 patent beyond knowledge contained in the prior art. [Dkt. No.

22 at 9–13]. Plaintiffs point to ten published clinical studies cited in the '956 patent, the '551 patent, and the Joint Publication that they assert identify the "identical" concepts that Dr. Wang claims to have contributed to the '956 patent. [Id. at 10–11 n.4–n.7]. They further contend that Dr. Wang admitted in the Counterclaim Defendants' Answer to the Complaint and in the '551 patent that the idea of using MSCs to treat multiple sclerosis was in the prior art. [Id. at 11–12]. Relying heavily on Coda Dev. s.r.o. v. Goodyear Tire & Rubber Co., No. 15-cv-01572, 2016 WL 5463058 (N.D. Ohio Sept. 29, 2016), Plaintiffs argue that the evidence is sufficient to establish at the motion to dismiss stage that all of Dr. Wang's alleged contributions to the '956 patent are encompassed by the prior art. [Dkt. No. 22 at 18]. In Coda, the plaintiffs brought claims for correction of inventorship under 35 U.S.C. § 256 in connection with patents for tires. The plaintiffs claimed that they contributed to the defendants' tire patents by conceiving "the placement of the pump tube, the design of the pressure management system, the efficiency of the leakage compensation system, and the air passageway/interface between the exterior to interior of the tire." Coda, 2016 WL 5463058 at *4. The court found that the plaintiffs were not joint inventors of the defendants' tire patents because one of the patents "actually identifies these very concepts as 'prior art'" and the PTO "allowed [the defendants'] claims over plaintiffs' own [earlier] patent application, meaning that the Office found them distinct," and dismissed the plaintiffs' claims. Id. at *5.

In Coda, the defendants' patent identified the specific alleged contributions as prior art. Here, none of the articles that Plaintiffs cite describes using hemangioblast-derived MSCs in the treatment of multiple sclerosis or other autoimmune disorders. See Lianhua Bai et al., Human Bone Marrow-Derived Mesenchymal Stem Cells Induce Th2-Polarized Immune Response and Promote Endogenous Repair in Animal Models of Multiple Sclerosis, 57 Glia 1192 (2009)

(addressing bone marrow-derived MSCs); David Gordon et al., Human Mesenchymal Stem Cells Abrogate Experimental Allergic Encephalomyelitis after Intraperitoneal Injection, and with Sparse CNS Infiltration, 448 Neuroscience Letters 71 (2008) (same); David Gordon et al., Human Mesenchymal Stem Cells Infiltrate the Spinal Cord, Reduce Demyelination, and Localize to White Matter Lesions in Experimental Autoimmune Encephalomyelitis, 69 J. Neuropathology & Experimental Neurology 1087 (2010) (same); Dimitrios Karussis et al., Safety and Immunological Effects of Mesenchymal Stem Cell Transplantation in Patients with Multiple Sclerosis and Amyotrophic Lateral Sclerosis, 67 Archives Neurology 1187 (2010) (same); Mandana Mohyeddin Bonab et al., Does Mesenchymal Stem Cell Therapy Help Multiple Sclerosis Patients? Report of a Pilot Study, 4 Iranian J. of Immunology 50 (2007) (same); Bassem Yamout et al., Bone Marrow Mesenchymal Stem Cell Transplantation in Patients with Multiple Sclerosis: A Pilot Study, 227 J. Neuroimmunology 185 (2010) (same); Emanuela Zappia et al., Mesenchymal Stem Cells Ameliorate Experimental Autoimmune Encephalomyelitis Inducing T-cell Anergy, 106 Blood 1755 (2005) (same); Jing Zhang et al., Human Bone Marrow Stromal Cell Treatment Improves Neurological Functional Recovery in EAE Mice, 195 Experimental Neurology 16 (2005) (same); J. Liang et al., Allogeneic Mesenchymal Stem Cells Transplantation in Treatment of Multiple Sclerosis, 15 Multiple Sclerosis 644 (2009) (addressing umbilical cord-derived MSCs); J.P.S. Peron et al., Human Endometrial-Derived Mesenchymal Stem Cells Suppress Inflammation in the Central Nervous System of EAE Mice, 8 Stem Cell Rev. & Rep. 940 (2012) (addressing human endometrial-derived MSCs). Further, as Plaintiffs acknowledge, when allowing the '956 patent's application, the patent examiner deemed the methods of using hemangioblast-derived MSCs to treat diseases free of the prior art. [Dkt. No. 22 at 5]. Thus, the Court finds that, on this sparse record,

Plaintiffs have not established that Dr. Wang's alleged contributions to the '956 patent (novel uses for hemangioblast-derived MSCs) are well-documented in the prior art.[1]

Second, Plaintiffs argue that Dr. Wang's alleged contributions to the '956 patent were too "insignificant in quality, when . . . measured against the dimension of the full invention" to qualify Dr. Wang as a joint inventor. [Id. at 15 (quoting Gipson v. Mattox, 511 F. Supp. 2d 1182, 1188 (S.D. Ala. 2007) (emphasis omitted)]. In support of this assertion, Plaintiffs point out that Claim 3 of the '956 patent provides a method of using hemangioblast-derived MSCs to treat over 60 diseases with only one of those diseases being multiple sclerosis. [Id. at 16]. Plaintiffs also contend that "[t]he Notice of Allowance from the patent examiner who granted the ['956] patent cited the importance of the new method of making MSCs in the context of the claimed invention," and that Dr. Wang admits that he did not contribute to this process. [Id.].

The Court disagrees that Dr. Wang's alleged contributions to the '956 patent are insignificant as a matter of law. Plaintiffs cite no case finding that an alleged contribution is insignificant at the motion to dismiss stage, nor do Plaintiffs point to any authority suggesting that significance is measured by the literal quantity of claim subparts encompassed by an idea. Federal Circuit law is clear that there is "no bright-line standard" in determining joint inventorship, Fina Oil & Chem. Co. v. Ewen, 123 F.3d 1466, 1473 (Fed. Cir. 1997), and that "[a]

[1] Plaintiffs also cite Burroughs Wellcome Co. v. Barr Labs., Inc., 40 F.3d 1223 (Fed. Cir. 1994) for the proposition that merely performing confirmatory tests using the EAE mouse model is insufficient to establish Dr. Wang's co-inventorship claim. [Dkt. No. 22 at 13–15]. In Burroughs Wellcome, following a three week trial, the district court granted judgment as a matter of law in favor of the defendants on the plaintiffs' inventorship claim where the evidence showed that the defendants formulated a definite and permanent idea of the invention before hiring the plaintiffs to establish efficacy of that invention through confirmatory testing, and the Federal Circuit affirmed. 40 F.3d at 1227–30. Burroughs Wellcome is inapposite, however, because the Counterclaim Defendants allege that Dr. Wang contributed to the idea of using hemangioblast-derived MSCs to treat autoimmune diseases and that he conceived of this idea before Drs. Kimbrel and Lanza. [Dkt. No. 20, Countercl. at ¶¶ 2, 18, 32, 33].

contribution to one claim is enough." Ethicon, 135 F.3d at 1460. The Court also disagrees with Plaintiffs' characterization of the Notice of Allowance. In the cited passage, the patent examiner explains that the method of using hemangioblast-derived MSCs was deemed free of the prior art because the patent applicants demonstrated that hemangioblast-derived MSCs differ from MSCs derived from bone marrow and embryonic stem cells. [Dkt. 23-1 at 7–8]. The patent examiner made no finding about the relative importance of the method of making hemangioblast-derived MSCs as compared to the methods of using those MSCs to treat the diseases claimed by the '956 patent. On the current record, the Court cannot fairly measure the significance of Dr. Wang's alleged contributions against the full '956 patent.

Based on all of the foregoing, the Court finds that the Counterclaim Defendants have alleged enough facts to state a plausible Section 256 claim to relief. See Twombly, 550 U.S. at 570. Thus, Plaintiffs' motion to dismiss the Counterclaim Defendants' correction of inventorship claim is denied.

B. Unjust Enrichment Claim

Plaintiffs' motion to dismiss the Counterclaim Defendants' unjust enrichment claim is wholly predicated on finding that Dr. Wang did not make any inventive contribution to the '956 patent. [Dkt. No. 22 at 19–20]. As such, it must also be denied.

III. CONCLUSION

For the foregoing reasons, Plaintiffs' motion to dismiss [Dkt. No. 21] is DENIED.

SO ORDERED.

September 28, 2018

/s/ Allison D. Burroughs
ALLISON D. BURROUGHS
U.S. DISTRICT JUDGE